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Three-spin-polarons and their elastic interaction in cuprates

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Abstract

Properties of quasiparticles in doped cuprates formed by an oxygen hole and two adjacent copper holes are investigated on the basis of the extended Hubbard model. The ground state energy, wave functions and the polaron-phonon coupling are calculated. We also analyzed the polaron-polaron interaction via the phonon field. It was found that this interaction is highly anisotropic and can explain the experimentally observed phase separation in the strongly underdoped LaSrCuO:Mn system.